



Complete Summary

TITLE

Perforated appendix: hospital admission rate.

SOURCE(S)

AHRQ quality indicators. Guide to prevention quality indicators: hospital admission for ambulatory care sensitive conditions [version 3.0a]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 58 p.(AHRQ Pub; no. 02-R0203).

Measure Domain

PRIMARY MEASURE DOMAIN

Population Health

The validity of measures depends on how they are built. By examining the key building blocks of a measure, you can assess its validity for your purpose. For more information, visit the [Measure Validity](#) page.

SECONDARY MEASURE DOMAIN

Access

Brief Abstract

DESCRIPTION

This measure is used to assess the number of admissions for perforated appendix per 100 admissions for appendicitis within Metro Area or county.

As a Prevention Quality Indicator (PQI), admission for perforated appendix is not a measure of hospital quality, but rather one measure of outpatient and other health care.

RATIONALE

Prevention is an important role for all health care providers. Providers can help individuals stay healthy by preventing disease, and they can prevent complications of existing disease by helping patients live with their illnesses. To fulfill this role, however, providers need data on the impact of their services and the opportunity to compare these data over time or across communities. Local,

State, and Federal policymakers also need these tools and data to identify potential access or quality-of-care problems related to prevention, to plan specific interventions, and to evaluate how well these interventions meet the goals of preventing illness and disability.

While these indicators use hospital inpatient data, their focus is an outpatient health care. Except in the case of patients who are readmitted soon after discharge from a hospital, the quality of inpatient care is unlikely to be a significant determinant of admission rates for ambulatory care sensitive conditions. Rather, the Prevention Quality Indicators (PQIs) assess the quality of the health care system as a whole, and especially the quality of ambulatory care, in preventing medical complications. As a result, these measures are likely to be of the greatest value when calculated at the population level and when used by public health groups, State data organizations, and other organizations concerned with the health of populations.

These indicators serve as a screening tool rather than as definitive measures of quality problems. They can provide initial information about potential problems in the community that may require further, more in-depth analysis.

Perforated appendix may occur when appropriate treatment for acute appendicitis is delayed for a number of reasons, including problems with access to care, failure by the patient to interpret symptoms as important, and misdiagnosis and other delays in obtaining surgery.

Timely diagnosis and treatment may reduce the incidence of perforated appendix.

PRIMARY CLINICAL COMPONENT

Perforated appendix; hospital admission rates

DENOMINATOR DESCRIPTION

Discharges with diagnosis code* for appendicitis in any field within Metro Area or county

*Refer to Technical Specifications document cited in the "Companion Documents" field for ICD-9-CM codes.

NUMERATOR DESCRIPTION

Discharges, age 18 years and older, with International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) diagnosis code* for perforation or abscess of appendix in any field. Patients transferring from another institution, or Major Diagnostic Category (MDC) 14 (pregnancy, childbirth, and puerperium) are excluded.

*Refer to Technical Specifications document cited in the "Companion Documents" field for ICD-9-CM codes.

Evidence Supporting the Measure

EVIDENCE SUPPORTING THE VALUE OF MONITORING THE ASPECT OF POPULATION HEALTH

- One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Evidence Supporting Need for the Measure

NEED FOR THE MEASURE

Monitoring health state(s)
Variation in health state(s)

EVIDENCE SUPPORTING NEED FOR THE MEASURE

AHRQ quality indicators. Guide to prevention quality indicators: hospital admission for ambulatory care sensitive conditions [version 3.0a]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 58 p.(AHRQ Pub; no. 02-R0203).

State of Use of the Measure

STATE OF USE

Current routine use

CURRENT USE

Monitoring health state(s)

Application of Measure in its Current Use

CARE SETTING

Ambulatory Care
Community Health Care

PROFESSIONALS RESPONSIBLE FOR HEALTH CARE

Physicians
Public Health Professionals

LOWEST LEVEL OF HEALTH CARE DELIVERY ADDRESSED

Counties or Cities

TARGET POPULATION AGE

Age greater than or equal to 18 years

TARGET POPULATION GENDER

Either male or female

STRATIFICATION BY VULNERABLE POPULATIONS

Unspecified

Characteristics of the Primary Clinical Component

INCIDENCE/PREVALENCE

Perforated appendix occurs in one-fourth to one-third of hospitalized acute appendicitis patients.

EVIDENCE FOR INCIDENCE/PREVALENCE

Braveman P, Schaaf VM, Egerter S, Bennett T, Schechter W. Insurance-related differences in the risk of ruptured appendix. N Engl J Med 1994 Aug 18; 331(7):444-9. [PubMed](#)

ASSOCIATION WITH VULNERABLE POPULATIONS

- Higher rates of perforated appendix have been noted in males, patients with mental illness or substance abuse disorders, people with diabetes, and blacks, as well as in children under the age of 4 (although appendicitis is rare in this age group).
- Braveman et al. found that the rate of perforated appendix was 50% higher for patients with no insurance or Medicaid than HMO-covered patients, and 20% higher for patients with private fee-for-service insurance. A follow-up study by Blumberg et al. concluded that the high rate of perforated appendix in the black population at an HMO may be explained by delay in seeking care, rather than differences in the quality of health care.
- Weissman et al. found that uninsured (but not Medicaid) patients are at increased risk for ruptured appendix after adjusting for age and sex.

EVIDENCE FOR ASSOCIATION WITH VULNERABLE POPULATIONS

Blumberg MS, Juhn PI. Insurance and the risk of ruptured appendix. N Engl J Med 1995 Feb 9; 332(6):395-6; discussion 397-8. [PubMed](#)

Bratton SL, Haberkern CM, Waldhausen JH. Acute appendicitis risks of complications: age and Medicaid insurance. Pediatrics 2000 Jul; 106(1 Pt 1):75-8. [PubMed](#)

Braveman P, Schaaf VM, Egerter S, Bennett T, Schechter W. Insurance-related differences in the risk of ruptured appendix. N Engl J Med 1994 Aug 18; 331(7): 444-9. [PubMed](#)

Weissman JS, Gatsonis C, Epstein AM. Rates of avoidable hospitalization by insurance status in Massachusetts and Maryland. JAMA 1992 Nov 4; 268(17): 2388-94. [PubMed](#)

BURDEN OF ILLNESS

Unspecified

UTILIZATION

Unspecified

COSTS

Unspecified

Institute of Medicine National Healthcare Quality Report Categories

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness
Timeliness

Data Collection for the Measure

CASE FINDING

Users of care only

DESCRIPTION OF CASE FINDING

Discharges with diagnosis code* for appendicitis in any field within a Metro Area or county

*Refer to Technical Specifications document cited in the "Companion Documents" field for ICD-9-CM codes.

DENOMINATOR SAMPLING FRAME

Geographically defined

DENOMINATOR INCLUSIONS/EXCLUSIONS

Inclusions

Discharges with diagnosis code* for appendicitis in any field within a Metro Area or county

*Refer to Technical Specifications document cited in the "Companion Documents" field for ICD-9-CM codes.

Exclusions

Unspecified

RELATIONSHIP OF DENOMINATOR TO NUMERATOR

All cases in the denominator are equally eligible to appear in the numerator

DENOMINATOR (INDEX) EVENT

Clinical Condition

Institutionalization

Patient Characteristic

DENOMINATOR TIME WINDOW

Time window is a single point in time

NUMERATOR INCLUSIONS/EXCLUSIONS

Inclusions

Discharges, age 18 years and older, with International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) diagnosis code* for perforation or abscess of appendix in any field

*Refer to Technical Specifications document cited in the "Companion Documents" field for ICD-9-CM codes.

Exclusions

Patients transferring from another institution, or Major Diagnostic Category (MDC) 14 (pregnancy, childbirth, and puerperium) are excluded.

MEASURE RESULTS UNDER CONTROL OF HEALTH CARE PROFESSIONALS, ORGANIZATIONS AND/OR POLICYMAKERS

The measure results are somewhat or substantially under the control of the health care professionals, organizations and/or policymakers to whom the measure applies.

NUMERATOR TIME WINDOW

Institutionalization

DATA SOURCE

Administrative data

LEVEL OF DETERMINATION OF QUALITY

Does not apply to this measure

TYPE OF HEALTH STATE

Adverse Health State

PRE-EXISTING INSTRUMENT USED

Unspecified

Computation of the Measure

SCORING

Rate

INTERPRETATION OF SCORE

A lower score is desirable

ALLOWANCE FOR PATIENT FACTORS

Analysis by subgroup (stratification on patient factors, geographic factors, etc.)
Risk adjustment method widely or commercially available

DESCRIPTION OF ALLOWANCE FOR PATIENT FACTORS

Observed (raw) rates may be stratified by areas (Metro Areas or counties), age groups, race/ethnicity categories, and sex.

Risk adjustment of the data is recommended using age and sex.

Application of multivariate signal extraction (MSX) to smooth risk adjusted rates is also recommended.

STANDARD OF COMPARISON

External comparison at a point in time
External comparison of time trends
Internal time comparison

Evaluation of Measure Properties

EXTENT OF MEASURE TESTING

Each potential quality indicator was evaluated against the following six criteria, which were considered essential for determining the reliability and validity of a quality indicator: face validity, precision, minimum bias, construct validity, fosters real quality improvement, and application. The project team searched Medline for articles relating to each of these six areas of evaluation. Additionally, extensive empirical testing of all potential indicators was conducted using the 1995-97 Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) and Nationwide Inpatient Sample (NIS) to determine precision, bias, and construct validity. Table 1 in the original measure documentation summarizes the results of the literature review and empirical evaluations on the Prevention Quality Indicators (PQI). Refer to the original measure documentation for details.

EVIDENCE FOR RELIABILITY/VALIDITY TESTING

AHRQ quality indicators. Guide to prevention quality indicators: hospital admission for ambulatory care sensitive conditions [version 3.0a]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 58 p.(AHRQ Pub; no. 02-R0203).

Identifying Information

ORIGINAL TITLE

Perforated appendix admission rate (PQI 2).

MEASURE COLLECTION

[Agency for Healthcare Research and Quality \(AHRQ\) Quality Indicators](#)

MEASURE SET NAME

[Agency for Healthcare Research and Quality \(AHRQ\) Prevention Quality Indicators](#)

DEVELOPER

Agency for Healthcare Research and Quality

ADAPTATION

This indicator was included in the original Healthcare Cost and Utilization Project Quality Indicator Set (HCUP QI).

PARENT MEASURE

Perforated appendix (Agency for Healthcare Research and Quality)

RELEASE DATE

2001 Oct

REVISION DATE

2006 Feb

MEASURE STATUS

This is the current release of the measure.

This measure updates a previous version: AHRQ quality indicators. Guide to prevention quality indicators: hospital admission for ambulatory care sensitive conditions [version 2.1, revision 4]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2004 Nov 24. 115 p. (AHRQ Pub; no. 02-R0203).

SOURCE(S)

AHRQ quality indicators. Guide to prevention quality indicators: hospital admission for ambulatory care sensitive conditions [version 3.0a]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 58 p. (AHRQ Pub; no. 02-R0203).

MEASURE AVAILABILITY

The individual measure, "Perforated Appendix Admission Rate (PQI 2)," is published in "AHRQ Quality Indicators. Guide to Prevention Quality Indicators: Hospital Admission for Ambulatory Care Sensitive Conditions." This document is available in [Portable Document Format \(PDF\)](#) from the [Prevention Quality Indicators Download page](#) on the Agency for Healthcare Research and Quality (AHRQ) Quality Indicators Web site.

For more information, please contact the QI Support Team at support@qualityindicators.ahrq.gov.

COMPANION DOCUMENTS

The following are available:

- AHRQ quality indicators. Prevention quality indicators: technical specifications [version 3.0b]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 May 1. 20 p. (AHRQ Pub; no 02-R0202). This document is available in Portable Document Format (PDF) from the [Agency for Healthcare Research and Quality \(AHRQ\) Quality Indicators Web site](#).
- AHRQ quality indicators. Prevention quality indicators: software documentation [version 3a] - SAS. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 35 p. (AHRQ Pub; no. 02-R0202). This document is available in PDF from the [AHRQ Quality Indicators Web site](#).

- AHRQ quality indicators. Prevention quality indicators: software documentation [version 3a] - SPSS. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 32 p. (AHRQ Pub; no. 02-R0207). This document is available in PDF from the [AHRQ Quality Indicators Web site](#).
- AHRQ quality indicators. Software documentation: Windows [version 3.0]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 72 p. This document is available in PDF from the [AHRQ Quality Indicators Web site](#).
- Prevention quality indicators (PQI): covariates, version 3.0a. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 10 p. This document is available in PDF from the [AHRQ Quality Indicators Web site](#).
- Remus D, Fraser I. Guidance for using the AHRQ quality indicators for hospital-level public reporting or payment. Rockville (MD): Agency for Healthcare Research and Quality; 2004 Aug. 24 p. This document is available in PDF from the [AHRQ Quality Indicators Web site](#).
- UCSF-Stanford Evidence-based Practice Center. Davies GM, Geppert J, McClellan M, et al. Refinement of the HCUP quality indicators. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2001 May. (Technical review; no. 4). This document is available in PDF from the [AHRQ Quality Indicators Web site](#).
- HCUPnet, Healthcare Cost and Utilization Project. [internet]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2004 [Various pagings]. HCUPnet is available from the [AHRQ Web site](#).

NQMC STATUS

This NQMC summary was completed by ECRI on December 19, 2002. The information was verified by the Agency for Healthcare Research and Quality on January 9, 2003. This NQMC summary was updated by ECRI on April 6, 2004, February 18, 2005, and again on February 27, 2006. The information was verified by the measure developer on July 31, 2006.

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